

**CLINICAL STUDY OF THE SIMULTANEOUS  
OPERATION FOR CHRONIC SIMPLE GLAUCOMA  
AND CATARACT**

**THESIS  
FOR  
MASTER OF SURGERY  
(OPHTHALMOLOGY)**



**BUNDELKHAND UNIVERSITY  
JHANSI (U. P.)**

---

1990

---

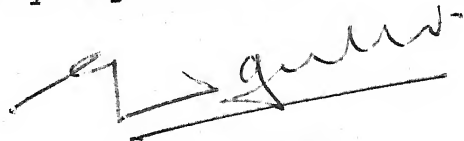
AJAY KUMAR GAUTAMI

---

C E R T I F I C A T E

This is to certify that the research work entitled "Simultaneous operation for simple glaucoma and cataract" which is being submitted as thesis for M.S. (Ophthalmology) examination of Bundelkhand University, Jhansi, 1990 by Dr. AJAY KUMAR GAUTAMI has been carried out in the department of Ophthalmology, M.L.B. Medical College, Jhansi.

He has put in the necessary stay in this department as per University regulations.



( G.D. GUPTA )  
M.S., D.O.M.S.,  
Head,

Department of Ophthalmology,  
M.L.B. Medical College & Hospital,  
JHANSI (U.P.)

Dated: August, 21, 1990.



C E R T I F I C A T E

This is to certify that the work entitled  
"Simultaneous operation for simple Glaucoma and  
Cataract" which is being submitted as thesis for  
M.S. (Ophthalmology) examination was carried out  
by Dr. AJAY KUMAR GAUTAMI himself under our direct  
guidance and supervision. His observations were  
checked by us regularly.

V  
( V.K. MISURYA )

M.S.,

Lecturer,

Department of Ophthalmology,  
M.L.B. Medical College & Hospital,  
JHANSI (U.P.)

( GUIDE )

B  
( B.S. JAIN )

M.S.,

Lecturer,

Department of Ophthalmology,  
M.L.B. Medical College & Hospital,  
JHANSI (U.P.)

( CO-GUIDE )

B  
( B.D. MATHUR )

M.Sc., D.H.S.,

Reader,

Statistics & Demography,  
Deptt. of Post Partum Programme,  
M.L.B. Medical College & Hospital,  
JHANSI (U.P.)

( CO - GUIDE )

## ACKNOWLEDGEMENT

Today, when I am going to submit my thesis work, I am not able to express my sincere feelings for those who helped, guided and encouraged me throughout the work period. So I am in confrontation when words find themselves unable to express what one feels in the depth of ones heart.

Same situation paralysis my thought when I find no words in the literature to express my deep sense of gratitude and humble thanks to my esteemed and learned teachers.

The immense and generous help, compounded by the expert guidance and constant encouragement, extended by Dr. V.K. Misurya, M.S., Lecturer in the department of Ophthalmology, M.L.B. Medical College & Hospital, Jhansi has imbibed in me an unflagging zeal for this work. His ready accessibility, even at his personal inconvenience and heartening words provided the self confidence so vital for undertaking such a project.

Words fail to express my deepest sense of gratitude to Dr. B.S. Jain, M.S., Lecturer, Department of Ophthalmology, M.L.B. Medical College & Hospital,

Jhansi for his constant and consistent help. He has been guided me. And to help even at his personal inconvenience at every stage this project. His keen interest and attention in day-to-day work progress was a source of constant inspiration to me.

A feeling of sincere greatfulness overwhelms me when I consider my revered and bonevolent teacher Dr. G.D. Gupta, M.S., D.O.M.S., Head of the department of Ophthalmology, M.L.B. Medical College & Hospital, Jhansi under whose masterly guidance, fatherly attitude and lovely temperament, I had an appportunity to work, I find myself lacking when it comes to choosing adequate words to express myself.

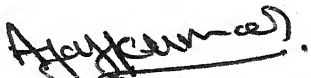
My very respectable and sincere thanks are to Mr. B.D. Mathur, M.Sc., D.H.S., Reader in Statistics & Demography, Post Partum Programme, M.L.B. Medical College & Hospital, Jhansi for his expert statistical guidance, wise suggestions and advise regarding this work.

All of my colleagues and friends, whose co-operation and pains taking help are unaccountable, deserve a special words of thanks to Dr. Ramesh Chandra Agarwal and Dr. Shiv Kumar must be particularly mentioned here.

At this moment of glory and award I humbly accept that all credit accrued actually goes to my parents, brothers, wife and my son Pankaj. Their affection, sacrifices and patience have made all this worth while.

My heartfelt gratitude and thankfulness is for the patients, who were the base of this project. To all of them I have to say : without you this could not have been possible.

The entire manuscript has been typed in an exemplary manner by Sri R.S. Vishwakarma. I am highly thankful to him for his patient and untiring efforts.

  
( AJAY KUMAR GAUTAMI )

Dated : August, 21, 1990

## C O N T E N T S

		<u>Page No.</u>
INTRODUCTION	.. ..	1 - 3
REVIEW OF LITERATURE	.. ..	4 - 19
MATERIAL AND METHOD	.. ..	20 - 28
OBSERVATION	.. ..	29 - 47
DISCUSSION	.. ..	48 - 58
CONCLUSION	.. ..	59 - 60
BIBLIOGRAPHY	.. ..	61 - 68
APPENDIX	.. ..	69 - 72
SUMMARY	.. ..	Enclosed separately

\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*  
\*\*\*\*\*



# **INTRODUCTION**



## INTRODUCTION :

---

The relationship between the glaucoma and cataract is very close. The combination of glaucoma and cataract in the same patient in ophthalmic practice is not infrequent. Management of co-existing glaucoma and cataract is difficult and controversial (Sugar H.S. Amer, J. Ophthalmol., 69 : 740, 1970). Simultaneously glaucoma and cataract in a patient poses the problems, whether to perform the glaucoma and cataract surgeries at the same time or to do one operation first followed by the second at a later date.

Some clinicians would surgically attack glaucoma first reasoning that the damage from glaucoma is irreversable, where as the visual deficits from cataract can be managed later. Others remove cataract first in the hope that intra-ocular pressure control will be easier later. One answer to dilemma in these cases is combined glaucoma and cataract operation. It has been attempted with varying degrees of success, encouraged by the good results and low rate of complications of single stage surgery. This has been favoured by many surgeons because of various advantages (Sorsby, 1967) such as -



One surgical & psychological trauma to the patient, short stay at hospital so reduction of cost, avoidance of malignant glaucoma, avoidance of second stage operation in high risk patients, avoidance of prolonged medications and early restoration of vision. Eye is only once exposed to the hazards of surgery, such as iritis, corneal diseases, infection, hyphaema and others.

The disadvantage is that it carries the higher risk of complications. However, the chances of complications depend upon the preoperative preparation and the surgical technique. The operative procedure become easy with judicious use of the hypotensive drugs, such as - carbonic anhydrase inhibitors, glycerol, hypertonic solution as Mannital, retrobulbar anaesthesia with pressure and it is further easier by cryoextraction. The combined procedures with various types of filtering operation have been attempted for many years with varying degree of success.

Most glaucoma procedures have been combined with cataract extraction including trephening, iridencleisis, sclerotomy, combined sclerotomy and iris inclusion and scleral cauterization. Each of these is a filtering

procedure and has the problem of attempting to produce a tight cataract wound and a filtering wound. In 1968 Cairns introduced the trabeculectomy, which has the advantage of a guarded filtering wound. This possibly avoided shallow or flat anterior chamber, post-operatively. Several authors in recent past have tried trabeculectomy in combination with cataract extraction. The results were encouraging, so this procedure of cataract operation extraction with trabeculectomy was performed in the present study for its further evaluation.



# **REVIEW OF LITERATURE**



## REVIEW OF LITERATURE

---

Cataract may be simply defined as any opacity in the lens. It is the most common and fortunately one of the most easily remedied cause of visual incapacity and blindness.

Though the history of cataract goes back some 4000 years and probably further. This was in Hindu medicine in which Sushrute defined cataract as an opacity of lens due to derangement of the intra-ocular fluid. He used to treat it surgically by couching.

The term glaucoma first used in the Hippocratic writings as we have seen, was  $\gamma\lambda\alpha\upsilon\kappa\omega\mu\alpha$  (glaucom) was used to describe blindness coming on in advancing years associated with a glazed appearance of the pupil (Duke Elder, 1969). Originally both diseases glaucoma and cataract considered in the lens. Only at a later date, it was differentiated by Celsus (25 B.C. AD 50) and Rufos (A.D. 95 - 117) and later by Galen (A.D. 131 - 210).

The first suggestion about glaucoma - that the disease is associated with a rise in intraocular pressure seems to occur in the Arabian Writings of At Tobarī (10th Century). The first original and clear recognition

of such a condition in European writings, however, is due to Richard Banister, 1622. The first original and clear recognition of glaucoma with a raised ocular tension was given by Antoine - Pierre Demours (1818) and clinical picture was the appearance of the colour of rainbow around lights.

After the introduction of ophthalmoscope, the Heinrich Muller (1856) observed the phenomenon of cupping of the optic disc.

Von Graefe divided glaucoma into three categories - (i) acute; (ii) Chronic; and (iii) secondary.

The Donders (1862), recognized that increased intraocular tension without any inflammatory symptoms is simple glaucoma.

The medical therapy for glaucoma was started by Adolf Weber (1876) and advocated the use of the extract of Jaborandi (Pilocarpine). The surgical therapy for glaucoma was started by William Mackenzie (1830), who introduced sclerotomy to relief raised ocular tension. The modern surgical therapy for glaucoma was started by Curan (1920), who introduced peripheral iridectomy to re-establish the communication between posterior and anterior chamber. While Jacques Daviel (1748-53) a French surgeon introduced a new technique for the extraction of cataract.

The association of simple glaucoma with cataract is a common combination and the observation in earlier days, that an iris prolapse occurring after cataract extraction in a case of glaucoma usually controlled the ocular pressure. This belief was further strengthened, when such a prolapse was removed in a case of glaucoma, the intraocular pressure elevated again. These two co-existing condition is a problem of treating it simultaneously and the development of cataract may aggravate a pre-existing glaucoma.

The combined procedure in 4th and 5th decades was not accepted widely. One reason for this was the view that cataract surgery alone may result in better glaucoma control. Vonlint (1939) stated that if miotics have been able to control intra-ocular tension, pre-operatively, lens extraction alone would result in control afterwards. Guyton (1945) also recommended the same procedure in a survey of 100 cases of cataract extraction in eyes with chronic open angle glaucoma, which were controlled medically pre-operatively.

Mawas (1964) found that control of open angle glaucoma with cataract was as difficult after as before cataract extraction. Scudari et al (1967), stated that

ocular pressure after elevated to a higher level than the pre-operative level 6 months after cataract surgery alone. Becher (1967) reported that glaucoma surgery will be required in some cases even after cataract extraction and the operations available for an aphakic eye are well known to be traumatic and unpredictable in results.

Chandler (1947); Thomas (1947); Sourdille (1950); Leydhecker (1954-56); Mehra & Dutta (1963) recommended that the glaucoma surgery undertaken before cataract extraction. There are many objections to this approach - the patient is exposed to double risk of two operation and filtering operation may itself accelerate the cataract progression (Sugar, 1970).

In a patient, who is suffering from glaucoma with cataract and operated for glaucoma, there has been little unanimity of opinion regarding the favourable site for cataract extraction. Williamson - Nobel (1953) advised a conventional incision ignoring the bleb. Most have favoured a corneal incision in front of the bleb (Scheie, 1962) advised inferior incision. Castroveijo, 1966; Collohan, (1952) used a lateral incision for the cataract extraction. Ingram (1963) using corneal section in 63 cases, reported only one failure in filtering bleb.



There are controversies and disadvantages to each of these procedures. The inferior section lacks the protective support of the upper lid during healing and cataract extraction through lower section is more difficult. An iridectomy in the 6'o clock often results in optical problem and its omission may lead to iris prolapse. The superior corneal with it the possibility of all the complications arising from corneal incision such a delayed wound healing delayed formation of anterior chamber and epithelial down growth.

Randolph et al (1971) is an analysis of 166 eyes treated with various methods have concluded that if a patient has controlled or uncontrolled glaucoma with cataract, a cataract extraction should be done first. The patient with uncontrolled glaucoma with field defects provide the surgeon with the choice of cataract extraction or combined extraction - filtration procedure. And it is ideal to obtain a filtering bleb, which will control the intra-ocular pressure without medications after cataract extraction.

The idea of simultaneous surgery for cataract and glaucoma by one stage operation is obviously attraction and many authors have described such operation in last

three decades. Claiming considerable success. The purpose of these operations had been to remove the cataract and at the same time to leave a fistulizing channel for the drainage of aqueous.

A small number of operations combining filtration and cataract extraction have been performed for many years.

Wright (1937) described combined extraction - iridectomy - sclerotomy for case of cataract and severe glaucoma. In the question and answer section of 1941 issue of Archives of Ophthalmology, a combination of iridencleisis and cataract extraction was recommended for such cases. Guyton (1945) mentioned the use of combination procedure but did not advocate them. Though later in 1952 Guyton in his discussion of Birge's paper mentioned the combination of cyclodialysis and cataract extraction in 10 cases with good results in all except one, in which, patient developed massive choroidal haemorrhage.

Lee & Weih (1950), reported the use of either iris inclusion or sclerotomy. They obtained excellent results and advised such combined operations for all the patients with uncontrolled tension and lenticular opacities.

Birge (1952), reported the first series of 25 eyes in which cataract extraction and iridencleisis performed simultaneously. In 88% cases glaucoma was controlled without further medical therapy.

Wolfe (1952), also recommended such combined filtration and cataract extraction in the same year.

Hughes (1959), described his procedure of combining anterior-sclerectomy and iris inclusion with cataract extraction in 57 cases. He in 1963 with Kazdan and co-workers reported the same operation in 122 patients. All types of glaucoma under went the combined procedure. In many cases a filtering operation had been successful.

Sugar (1962), mentioned combination of cataract extraction with iridencleisis might occasionally be an acceptable procedure.

Mawas (1964), incarcerated a rectangular iris flap in the incision, which controlled the pressure in 19 out of 22 eyes.

Stocker (1964), described an operation combining cataract extraction and scleral cauterization, but did not mention the statistics.

Birge (1966), who previously has used iris inclusion alone, later advocated posterior lip sclerotomy with iris

inclusion. The results were good. On a follow up period of five years. It was not associated with any greater complication than a simple intracapsular cataract extraction. Incidence of flat anterior chamber or infection was less than 1%.

Scudari (1967) combined cataract extraction with iris inclusion and sclerotomy in 59 eyes. 49 eyes has tension below 20 mm of Hg.

Dellaporta (1971) combined trepheno-trabeculectomy with extraction of cataract.

Donoghue (1972) combined the removal of cataract with inclusion of a flap of iris.

In a hinged sclerotomy opening behind the cataract incision. He presented a series of 21 cases. Results were better and complications were less in case of open angle glaucoma than closed angle and secondary glaucoma. Average reduction of pressure was 13 mm of Hg.

Shmeleva (1972) of Russia combined cataract extraction with trabeculectomy. In all cases, there was good hypotensive effect.

Hilsdorf (1974) stated that the complications with trabeculo-cataract surgery were few and results were favourable in a series of 37 eyes.



Vancea and Schwartzberg (1974) combined with trabeculectomy in 36 eyes and followed for 6 to 30 months. Tension was normal in 17 eyes. While success in 94.45% eyes with medications, the mean I.O.P. being 14.77 mm of Hg.

Stewart and Loftis (1976) performed two types of combined extraction and compared them. 43 eyes of both chronic narrow angle and open angle glaucoma were operated.

In combined extraction with trabeculectomy 74% eyes improved in visual acuity. 91% had normal I.O.P. without medications. While 31% had transient hyphaema post-operatively in combined extraction with thermal sclerotomy, vision improved in 61%. 61% had normal tension while 17% had hyphaema but they could not analyse the higher success in trabeculectomy group.

Jerndal and Lundstrom (1976) combined trabeculectomy with cataract extraction. The pre-operative tension ranged between 20 - 60 mm of Hg. (average 33 mm of Hg.). There was 50% average decrease in the intraocular pressure. The post-operative tension varied between 10 - 26 mm of Hg. The average being 16 mm of Hg. Visual acuity improved in 14 eyes, remaining unchanged in 2 eyes and deteriorated in

one eye. The follow up period varied between 6 - 20 months. As for as complications are concerned, the hyphaema was the main complication. Two patient had choroidal detachment. One with flat chamber and iris prolapse. Filtering bleb was presented in 7 cases only 3 eyes required post-operative medications for the control of pressure.

Witmer and Rohen (1976) combined trabeculectomy cataract extraction in a series of 100 cases. The ocular tension normalised in 94 eyes. Only 6 eyes, it was failure. 14 eyes, however, needed additional medication to control the tension satisfactorily. In 20% of the cases, the tension remained high during the first four weeks, but dropped to normal after about 3 months.

Mackenson and Orsoni (1978) combined cataract extraction with trabeculectomy in 56 eyes after the follow up of 6 months. 63% had normal intra-ocular tension. While 34% required medications. No serious complication was observed. Gordon et al (1974) combined the cataract extraction with trabeculectomy in 37 eyes of various type of glaucoma. The average follow up duration was 23.7 months. The average pre-operative intra-ocular pressure was 23.5 mm and the average post-operative intra-ocular pressure was

15.2 mm of Hg. visual acuity improved 64.9% cases and without improvements in others. 59.5% did not require any medications at all. No greater incidence of complications in combined procedures from that expected cataract extraction alone except flat chamber and hyphaema in 4 eyes each.

Singh et al (1979) combined pretrabecular filtration with cataract extraction in 70 cases (62 lens induced and 8 primary open angle glaucoma). Average follow up period was 195 days. The tension in 57 (81.6%) cases was below 20 mm. 9 (12.8%) cases between 21 - 30 mm and in 4 (5.6%) cases above 30 mm of Hg. The pressure was controlled by 2% pilocarpine in 9 cases in which tension varied between 21 - 30 mm of Hg. So overall success in 94.4% cases.

Wechsler and Robinson (1980) combined with trabeculectomy with 91% success in 70 cases. Spaeth (1980) combined extraction of lens with trabeculectomy partial punch sclerectomy, iridencleisis and cyclodialysis, but did not find a single combination suitable for all type of cases.

Edwards (1980) extracted 59 cataracts with trabeculectomy and follow up period was varying between 6 months to two years. Visual outcome was better in chronic simple and narrow angle then secondary glaucoma.



Manjoor et al (1981), reported trabeculectomy with cataract extraction in 20 cases. In 19 (95%) eyes the tension was controlled between 10 - 24 mm of Hg. Only one needed medical therapy visual acuity increased in 17 eyes. The only complication was hyphaema. The follow up period varied from 2 to 10 months.

Romem et al (1982) combined cataract extraction with trabeculectomy in 46 eyes (38 open angle and 8 narrow angle glaucoma). Average follow up period was 27 months. Tension turned normal in 33 (71.74%) eyes without drugs. While 12 (26.09%) required medications and one uncontrolled required further surgery.

Klemetti and Kalima (1982) extracted 94 cataract with trabeculectomy (59 open angle while 35 capsular glaucoma). Follow up period was 1 to 9 years. Average being 3.4 years. 61 (65%) eyes had tension below 21 mm without medications. 31 eyes required additional medical therapy, while 2 needed further surgery.

Complications : The hypotony was in 37% and hyphaema in 30%. The success rate were 76% after one year follow up, 63% after 2 years and 45 to 66% after 3 - 8 years follow up.

Khurana and Ahluwalia (1988) reported trabeculectomy Vs Gonio punch - combined with cataract extraction in 50 patients. In 42 (84%) eyes the tension was controlled (less than 21 mm of Hg.). Out of this 42 cases 5 had pressure less than 10 mm of Hg.; in remaining eyes, it ranged between 11 and 21 mm of Hg. and 8 eyes require medical therapy. And out of these 8 eyes in 3 cases pressure was controlled after further surgery, while in one case it remained uncontrolled even after repeated surgery.

Prasad et al (1988) combined trabeculectomy and cataract extraction in 96 eyes heaving senile cataract and associated open angle glaucoma at B.R.D. Medical College, Gorakhpur. The preoperative tension ranged between 29 to 69.3 mm of Hg. (Average 48.72 mm of Hg.). The post-operative tension varied between 11.2 to 29 mm of Hg. The average being 17.93 mm of Hg.

Out of a total 96 operated cases in 88 eyes (91.67%), the intraocular tension was well controlled and in 8 eyes, it was not controlled inspite of medical treatment. The vision improved in 87.5% cases.

DRUG REVIEW :

Various drugs are used to reduce the intraocular pressure.

Acetazolamide : It is a carbonic anhydrase inhibitor. It reduces the production of aqueous by about 50% (Backer and Hay, 1958). Draeger et al (1963) it is given orally in the dose of 125 - 500 mg one to four times a day and after single dose its action is apparent in 60 - 90 minute reach a maximum in 3 - 5 hours and wearoff in about 12 hours. Sustained action capsule of the drug have a more prolong effect did not given more than twice a day (Stepanic, 1967).

Osmotic agent : These substances raised the osmolarity of the plasma, so that fluid with drawn from the eye resulting in fall of intraocular pressure.

- Various indication for use of osmotic agent;
- Angle closure glaucoma;
- Secondary glaucoma; and
- Pre-operative.

Urea : First used osmotic agent (Alder, 1933) it induces marked hypotony (Aizawa, 1962).

Mannitol : According to Galin et al (1963), it has less side effect than urea and it is more potent hypotensive agent than urea. Seeger and Lewis (1962), it is used intravenously. Different osmotic agent used are given in table with their route of administration and doses.

Table

Shows the different osmotic agent with their route of administration and doses

Name	Route of administration	Dose
Glycerol	Oral	1-1.5 gm/kg
Ethylalcohol	Oral	0.1-1.5 gm/kg
Isorbide	Oral	1 gm / kg

Side effects : Dehydration of body cause headache, pain in the back, mental confusion, disorientation, (Tarter and Linn, 1961; Becker, 1967). Diuresis is enhanced markedly with mannitol and they must be used with caution in patient with the cardiac renal and hepatic diseases.

Betablockers : As early as 1967 Philips, C.I.; Howitt, G. and Rowland, D.J. introduce propranolol into glaucoma therapy. However, because of its mild anaesthetic properties have made many investigators reluctant to use it as a topical medication for glaucoma. Hall et al (1970) describe a new beta-adrenergic blocking agent timolol. It blocks both beta 1 and beta 2 receptors. Timolol has neither sympathomimetic effect nor anaesthetic properties. Hall, R.A. et al (1970); Scriabine, A. (1973) it is proved that it has 5 - 6 times greater activity than propranolol.





## **MATERIAL AND METHOD**

## MATERIAL AND METHOD

---

The present study was carried out in the department of Ophthalmology, M.L.B. Medical College & Hospital, Jhansi between March, 1989 to May, 1990. The patient selected have marked visual defect because of the lenticular opacities and raised intra-ocular pressure. The patients suffering from chronic simple glaucoma with cataract were taken up for the study.

The patients were of either sex and age ranged from 31 to 70 years. Number of eyes underwent surgery were 20. The minimum follow up period was 2 months. The surgery was done by the consultant surgeons of the department.

The following pattern was adopted for almost all the patient :

### HISTORY OF PRESENT ILLNESS :

Any history of headache and eyeache, its severity duration and association with vomiting, diminution of vision, redness and watering of eye was inquired and recorded. History of anti-glaucoma therapy was asked, if any.



PAST HISTORY :

Regarding previous attack of some disease like trauma, vomiting, diabetes or visual disturbances, if any, was noted.

PERSONAL HISTORY :

History of smoking, tobacco, chewing and addiction of alcohol or drug is noted.

EXAMINATIONS :Systemic :

Recording of pulse, blood pressure, temprature, examination of central nurvous system, respiratory system, cardiovascular system and G.I. tract.

Local :

The local examination was done under bright illumination with the help of uniocular loupe (10 x) and (+ 13 D) condensing lens. By this, we examine the conjunctiva, cornea, anterior chamber, iris pupil and lens.

The slit lamp examination was done routinely particularly to examine the transparency of cornea, aqueous flare, keratic precipitates, extent of lenticular opacities.

INVESTIGATIONS :

Routine :

It includes urine for albumin, sugar and microscopic examination in all the cases. And wherever indicated blood sugar, total leucocyte count, differential leucocyte count blood haemoglobin, erythrocyte sedimentation rate etc.

Special :

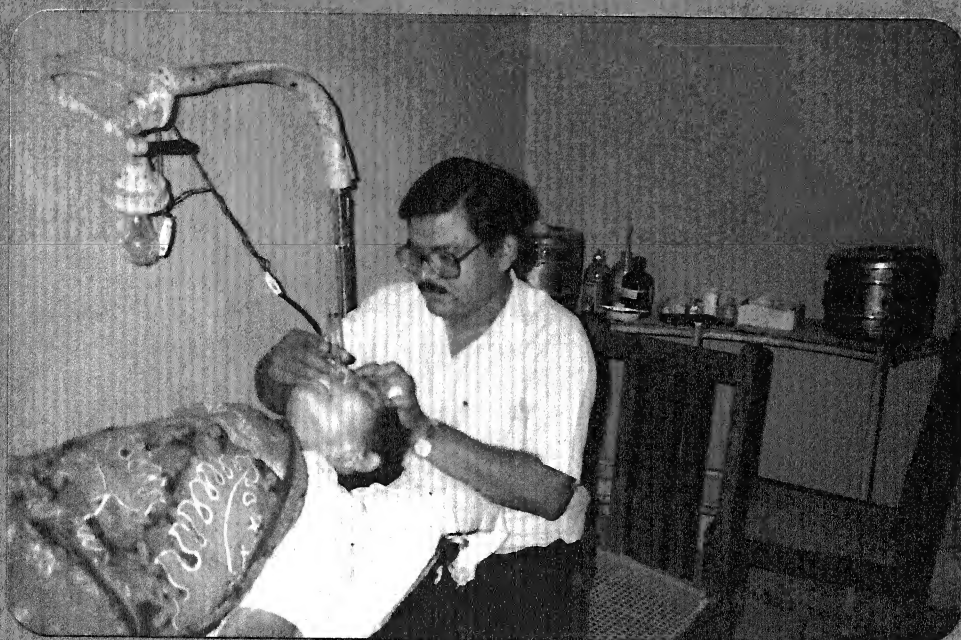
- (1) Visual acuity : This was recorded in terms of snellen's test type, finger counting, hand movements, perception of light and projection of rays, depending on the individuals visual status. The best corrected visual acuity was recorded in post-operative and follow up period.
- (2) Pupillary examination : Pupil of both eyes were seen for -
  - pupillary reaction;
  - size of the pupil; and
  - shape of the pupil.

Pupillary reaction - direct and consensual, pupillary reaction were seen with the help of torch.

(3) Tonometry : It was performed with the Schiot'z tonometer with standard technique in all the cases. One particular Schiot'z tonometer was used pre-operatively, post-operatively and in follow up period.

- Patient was asked to lie down in supine position looking straight at the ceiling of the examination room.
- Xylocaine 4% was instilled into the both eyes until local surface anaesthesia was complete.
- Both eye lids were separated with the finger without pressing on the eyeball and then the tonometer was placed vertically on the cornea, so that it rest by its own weight.
- Depending on the tension of the eye, there was a deflection of the recording needle on the scale.
- The reading on the scale was then translated from the conversion chart into milimeter of mercury.





PHOTOGRAPH SHOWING  
SCHIOTZ TONOMETRY  
(RIGHT EYE)



- (4) Fundus examination : Both distant direct and direct ophthalmoscopy were done post-operatively by Keelers Mediclux Ophthalmoscope. The condition of the media, optic disc such as size, shape, colour, excavation margins, nasal shifting of vessels and disc cup ratio, were noted. Beside this any abnormality in the fundus was recorded.
- (5) Gonioscopy : It was done in all the 20 patients by Goldman's three mirror gonioscope to assess mainly the angle status (open or closed). Beside these the peripheral anterior synechia and neo-vascularisation of the angle, if any, were noted.

When the desired investigations were complete, the patient was subjected for medical therapy followed by surgical intervention.

Pre-operative preparation :

The patient were mentally prepared to undergo combined surgery (trabeculectomy with cataract extraction). To relieve the anxiety and to have good sleep night before the operation diazepam 5 mg tablet was given. The eye lashes were cut a day before and lignocain sensitivity has to be done with 2% lignocain.

The intraocular pressure was controlled with acetazolamide 250 mg tablet in suitable doses, alongwith timolol eye drop 0.25 to 0.5% two times in a day.

When the tension was not controlled, intravenous mannitol 20% was injected an hour before the operation. To premedicate the patient injection pentazocine 30 mg and injection phenargan 50 mg were given intramuscularly, half an hour before the operation.

ANAESTHESIA :

Topical : By instillation of 4% lignocain 4 - 5 times at 2 minutes interval.

Regional Akinesia : It was obtained by 2% lignocain with adrenalin by O' Briens's method preferably and whenever, essential by Vanlint's technique too.

Ciliary Block : By 1 ml. retrobulber injection of 2% lignocain with adrenlin followed by ocular massage for 2 - 3 minutes.

STEPS OF OPERATION :

The operation was done under 3 X magnification by magnifying glasses. After the lid and superior rectus suturing, a limbal based conjunctival flap was

formed over the superior. 180 degree approximately 8 mm from limbus at 12 O'clock position and gradually tapered down close to the limbus at 3 and 9 O'clock position. Flap was reflected over the cornea and limbus cleared. The superficial vessels were thermally cauterized.

A 4x 4 mm half thickness scleral flap was then formed and dissected towards the cornea at 12 O'clock position as in routine Watson's trabeculectomy. Partial penetrating limbal grooves were then made on the either side of the trabeculectomy flap.

Two preplaced 8.0 silk mattress suture were passed through the grooves. A trabeculectomy window measuring 3 x 1 was then formed with a razor blade fragment. The posterior edge being along the line of spur. This rectangular piece was elevated with a fine toothed forceps and cut with corneal scissors. Thus the region of canal of schlemm and trabeculae was excised.

If iris prolapsed at this stage an iredelectomy preferably peripheral, otherwise complete was done. Corneal scissors were then introduced through trabeculectomy window to extend the corneal section.

passing through the performed grooves. If not already done, an iridectomy was done after the completion of section. After releasing the superior rectus muscle stich cataract extraction was done by cryoprobe. The two preplaced mattress sutures were tied iris was repositioned. The scleral trap door was stiched back with two 8.0 silk buried sutures. The conjunctival flap were then stiched with 8.0 silk, sterile air was injected to reform the anterior chamber. Sub-conjunctival injection of decodorn 1 mg and gentamicin 10 mg was given, when indicated.

The operative complications were managed as in routine cataract extraction. After applying atropine 1% and antibiotic ointment, the eye was bandaged.

#### POST OPERATIVE MANAGEMENT :

A suitable systemic antibiotic usually chloramphenicol 250 mg four times a day with anti-inflammatory drugs were given to all the patients for 3 days atleast.

Daily dressing was done with corticosteroid and antibiotic ointments. 1% atropine was added in case of iritis or in whom sector iridectomy was performed. Injection gentamicin, decodorn and atropine were given, subconjunctivally when indicated.



The eye was examined on every dressing and post-operative details were noted. Particular attention was paid to the condition of section wound. Striate keratitis depth of anterior chamber, hyphaema and any sign of iritis were managed, accordingly.

In uncomplicated cases, the conjunctival and corneo-scleral stiches were removed, on 8<sup>th</sup> day and the patient was discharged subsequently with the follow up treatment and advice.

THE FOLLOW-UP :

The patients were advised for the follow up examination at one week interval, for two weeks, after discharge. Then fortnightly for three visits, one monthly examination for three months. Then at three to six months interval of whenever, there is any problem.

At follow up visits the eye was examined for any filtering bleb, transparency of cornea, depth of anterior chamber, and condition of iris etc. Funduscopy and gonioscopy was done. More emphasis was given on corrected visual acuity and intraocular pressure. All the findings were recorded for the final assessment.



# **OBSERVATION**

## OBSERVATION

The present study of the simultaneous operation for simple glaucoma and cataract was carried out in the department of Ophthalmology, M.L.B. Medical College, and Hospital, Jhansi during the period from March, 1989 to May, 1990. During this period 20 patients were operated and were followed up. All twenty eyes were operated for both glaucoma and cataract simultaneously. The follow up of the patients varied in between 2 months to 10 months.

AGE AND SEX INCIDENCE :

The age and sex of the patients are shown in table no. 1.

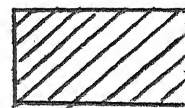
Table no. 1

Distribution of cases according to age and sex of patients

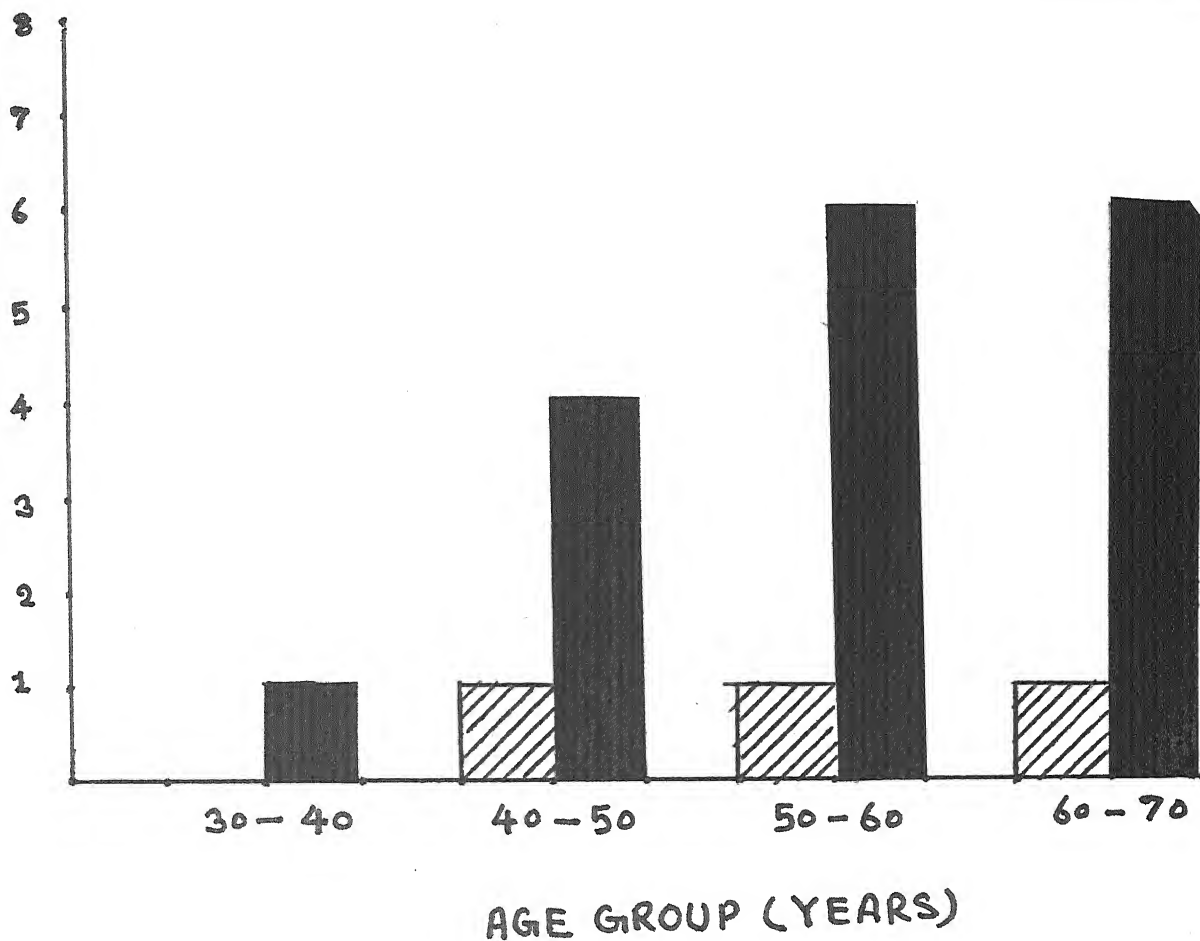
Age groups (in years)	Male patients		Female patients		No. of patients	
	No.	%	No.	%	No.	%
30 - 40	0	0	1	5	1	5
40 - 50	1	5	4	20	5	25
50 - 60	1	5	6	30	7	35
60 - 70	1	5	6	30	7	35
Total	3	15	17	85	20	100

NO. OF CASES

MALE



FEMALE



GRAPH SHOWING AGE AND  
SEX DISTRIBUTION IN  
PRESENT STUDY



The age of the patients varied between 31 to 70 years. The average age of the patients was 56.3 years. Age group 31 - 40 includes 1 (5%) patient out of which none is male and 1 is female. Age group 41 - 50 years includes 5 (25%) patients. The numbers of male patient in this age group is 1 (5%) and female 4 (20%) patients. The age group 51 - 60 includes 1 (5%) male and 6 (30%) females. The age group 61 - 70 years includes 7 (35%) patients out of which 1 (5%) male and 6 (30%) females.

The minimum number of one patient was in the age group 31 - 40 years and that was female patient.

The maximum number of patients recorded in the 6<sup>th</sup> and 7<sup>th</sup> decade. Each groups includes 7 patients out of which each group includes one male and six female patients.

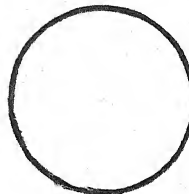
The present study includes 20 patients out of which 3 (15%) is males and 17 (85%) females.

MALE

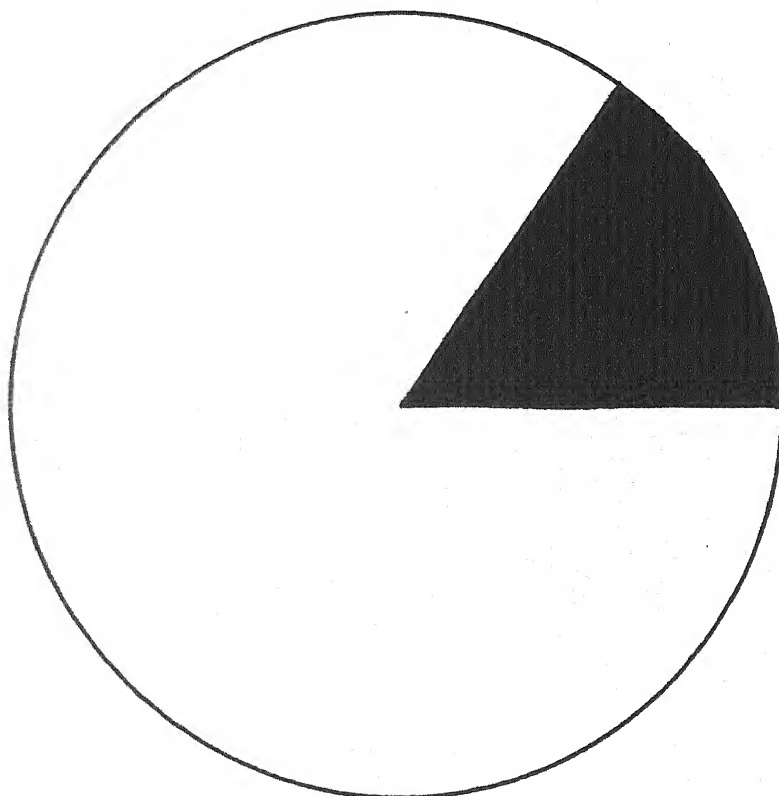


15%

FEMALE



85%



GRAPH REPRESENTING THE  
MALE AND FEMALE  
PATIENTS



PHOTOGRAPH OF A CASE OF  
CHRONIC SIMPLE GLAUCOMA  
WITH CATARACT  
(RIGHT EYE)



TYPE OF CATARACT :

The type of cataract with chronic simple glaucoma in 20 eyes are shown in table no. 2.

The maximum number of patients having mature cataract with chronic simple glaucoma that is 15 (75%) and 5 patients had immature cataract with chronic simple glaucoma.

Table - 2

Break-up of Pre-operative diagnosis as related to the type of cataract with chronic simple glaucoma

Type of cataract	No. of eyes	%
Mature cataract with chronic simple glaucoma	15	75
Immature cataract with chronic simple glaucoma	5	25
Total	20	100

SOCIO-ECONOMIC STATUS :

We divided the patients according to their socio-economic status. There was no patient from upper class and upper middle class. Only 5 (25%) patients belong to middle class and 7 (35%) patients were from lower middle class and 8 (40%) patients were from lower class.



The maximum number of patients 8 (40%) were in the lower class and minimum number of patients 5 (25%) were in the middle class.

Table - 3

Distribution of cases according to socio-economic status

Socio-economic class	Per capita income (Rs.)	No. of cases	Percentage
Upper class	600 or above	0	0
Upper middle class	300 - 599	0	0
Middle class	140 - 299	5	25
Lower middle class	60 - 139	7	35
Lower class	Less than 60	8	40
Total		20	100

We further divided the patients from Urban or Rural area. The number of patients came from Urban area were 9 (45%), while from Rural area were 11 (55%).

As for as the side of eyes was concerned 10 (50%) were right while rest 10 (50%) were left.

THE PRESENTATION OF SYMPTOMS :

The patients presented with gross visual deficit because of advanced lenticular opacities and glaucoma.

The patients presented gradual diminution of vision with mild headache and eyeache, the symptoms varying from 6 months to 2½ years.

PRE-OPERATIVE VISUAL STATUS :

Table number 4 shows pre-operative visual acuity of 20 eyes, with chronic simple glaucoma and cataract. One (5%) eye had visual acuity 1/60. Six (30%) had hand movement and nine (45%) had positive PL & PR and only two (10%) had PL with defective PR.

So the maximum visual acuity was 1/60, while minimum PL with defective PR.

Table - 4

Distribution of eyes according to pre-operative visual acuity

Visual acuity	No. of eyes	Percentage
1/60 - 3/60	1	5
Counting fingers	2	10
Hand movement	6	30
PL + PR	9	45
Only PL	2	10
Total	20	100

PRE-OPERATIVE INTRA-OCULAR PRESSURE :

The intra-ocular pressure at the time of admission (initial tension) is shown in table no. 5.

Table - 5

Distribution of pre-operative intra-ocular pressure in 20 eyes

Tension (mm. of Hg)	No. of eyes	Percentage
20 - 30	6	30
30 - 40	8	40
40 - 50	6	30
50 - 60	0	0
Total	20	100

Pre-operative average intra-ocular tension was 34.49 mm of Hg.

Six (30%) eyes were recorded with tension in between 20 - 30 mm. of Hg. Eight (40%) with tension in between 30 - 40 mm. of Hg. Six (30%) had tension in between 40 - 50 mm. of Hg.

The minimum tension recorded was 24.6 mm. of Hg. While the maximum being 49.8 mm. of Hg.

Other eye :

The other eyes invariably 13 having raised intra-ocular tension and 3 eyes had filtering operation and two eyes having normal tension and one patient having only one eye and one eye had iridencleisis with aphakia.

PRE-OPERATIVE ANTIGLAUCOMA THERAPY :

The anti-glaucoma therapy was given to all the patients and is shown in table number - 6.



Table - 6

## Pre-operative antiglaucoma therapy

Medicine	No. of patients	Percentage
Acetazolamide alone	6	30
Acetazolamide + Pilocarpine	5	25
Acetazolamide + Timolol	4	20
All above + mannitol	5	25
Total	20	100

Acetazolamide was used in all 20 patients. It alone controlled the tension in 6 (30%) eyes with mild rise of tension. More over, these eyes were operated upon a day or two later.

The tension was controlled in further 5 (25%) eyes with pilocarpine 2% and acetazolamide. The tension was controlled in further. 4 (20%) eyes with timolol 0.5% and acetazolamide even after using above all the three drugs, tension remained high in 5 (25%) eyes. So intravenous mannitol was given one hour before surgery.

Surgical treatment was done as quickly as possible after an initial medical treatment. Cataract extraction was performed in single stage alongwith trabeculectomy.

OPERATIVE COMPLICATIONS :

The various complications occur pre-operatively, during operation and immediate after operation and are recorded in table no. 7 & 8.

(a) Pre-operative complication :

There was no pre-operative complication .

(b) Intra-operative complications :

These are recorded in table no. 7. The most common complication was hyphaema that was seen in 2 (10%) eyes. It was never massive enough to interfere with the operation.

Extra capsular lens extraction occurred in 2 (10%) eyes.

Iris injury occurred in 1 (5%) eyes, while vitreous prolapse seen in 1 (5%) eyes.

Table - 7

## Intra-operative complications

Complication	No. of eyes	Percentage
Extra capsular lens extraction	2	10
Iris injury	1	5
Hyphaema	2	10
Vitreous prolapse	1	5
Total	6	30

(c) Immediate post-operative complication :

The complications occurring within 15 days of follow up period were considered immediate or as early post-operative complications that was recorded in table no. 8.

Table - 8

## Immediate post-operative complications

Complication	No. of eyes	Percentage
Striate keratitis	6	30
Shallow A.C.	1	5
Hyphaema	2	10
Iritis	3	15
Hypotony	2	10
Total	14	70





PHOTOGRAPH OF A CASE OF  
CHRONIC SIMPLE GLAUCOMA  
WITH CATARACT AFTER  
COMBINED OPERATION  
(RIGHT EYE)



The striate keratitis was observed in 6 (30%) eyes. It cleared in all the cases within 15 days of follow up.

Iritis was seen in 3 (15%) eyes. It was mild in two cases and moderate in 1 case and was treated accordingly. Iritis was cured in all the cases during follow up period.

Hypphaema was observed in 2 (10%) eyes. It was seen from very first day but disappeared within 3 - 4 days.

Hypotony- when the intra-ocular tension was 10 m.m. of Hg. or less than 10 m.m. of Hg. It was labelled as hypotony. It was seen in 2 (10%) cases at the first follow up visit, the hypotony was no more seen in by the end of 2½ months follow up.

Shallow anterior chamber - It was observed in 1 (5%) case from the very first day post-operatively and it was recovered within 5 - 6 days after pressure bandage application.

Late post-operative complication - These were seen during follow up period are shown in table no. 9.

Table - 9

## Late post-operative complications

Type of complication	No. of eyes	Percentage
Iris prolapse	1	5
Distortion of pupil	3	15
Vitreous opacities	2	10
Infection	0	0
Total	6	30

Iris prolapse - Iris prolapse at 2 O'clock position was seen in 1 case. This iris prolapse was underneath the conjunctiva.

Distortion of pupil - was seen in 3 cases.

Vitreous opacities and floaters - were seen in 2 (10%) cases in one patient had hyphaema during operation in other case, it was either because of vitreous haemorrhage or degeneration.

TENSION CONTROL :Post-operative intra-ocular pressure :

Post-operative intra-ocular pressure, its follow up and control has been shown in table - 10.

Table - 10

Intra-ocular tension during follow-up period

Tension m.m. of Hg.	A		B		C	
	By the end of 15 days		By the end of 1 month		At the end of 2 months	
	No.	%	No.	%	No.	%
5 - 10	3	15	2	10	2	10
10 - 15	7	35	6	30	4	20
15 - 20	6	30	9	45	13	65
20 - 25	4	20	2	10	0	0
25 - 30	0	0	1	5	1	5
Total	20	100	20	100	20	100

By the end of 15 days of follow up, the minimum tension recorded was 8.5 m.m. of Hg., while maximum was 22.4 m.m. of Hg.

Tension in 3 (15%) eyes was recorded in between 5 - 10 mm. of Hg. In 7 (35%) of eyes was recorded in between 10 - 15 m.m. of Hg. In 6 (30%) of eyes in between 15 - 20 mm. of Hg. While in 4 (20%) of eyes, it was in between 20 - 25 mm. of Hg. By the end of 1 month of follow-up 2 (10%) eyes had tension in between 5 - 10 mm. of Hg. 6 (30%) had tension in between 10 - 15 mm. of Hg., while 9 (45%) eyes had tension in between 15 - 20 mm. of Hg. and 1 (5%) eye had tension in between 25 - 30 mm. of Hg.

The minimum tension recorded in this period was 9.4 mm. of Hg. While maximum tension recorded was 27.2 mm. of Hg. with an average of 15.84 mm. of Hg.

The tension was raised in 3 (15%) of eyes at the end of one month of follow-up. All 3 cases were put on medical therapy out of which two were controlled, while one case is remained uncontrolled at the end of 7 months of follow-up and at the end of follow-up patients advised for further surgery, but patient refused for that.



At the table no. 11 shown that the end of the two months of follow up, 2 (10%) eyes had tension in between 5 - 10 mm. of Hg. and 4 (20%) had tension in between 10 - 15 mm. of Hg. 13 (65%) had tension in between 15 - 20 mm. of Hg. While one had tension in between 25 - 30 mm. of Hg.

At the end of follow-up the minimum recorded tension was 94 mm. of Hg., which is recorded in case no. 10 and 15 respectively.

While maximum recorded tension was 27.2 mm. of Hg., which is recorded in case no. 5.

The average tension at the end of follow-up was 16.52 mm. of Hg., which is shown in table no. 11.

Table - 11

Showing pressure control

	Pre-operative	Post-operative
Average I - O.P. (m.m. of Hg.)	34.49	16.52

POST-OPERATIVE TENSION CONTROL :

The table no. 12 shown post-operative tension control.

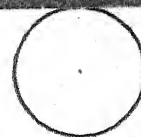
Table - 12

Post-operative outcome of Intra-ocular pressure during follow-up

Months	No. of eyes			No.	%
	Controlled without therapy	Controlled with therapy	Un-controlled		
0 - 2	17	2	1	20	100
2 - 4	12	0	1	13	65
4 - 6	11	0	1	12	60
6 - 8	5	0	1	6	30
8 - 10	1	0	1	2	10

Table no. 12 shows that at the end of 2 months follow-up 17 (85%) patients had controlled tension & 2 (10%) patients required additional medical therapy to control the intraocular tension below 22 mm. of Hg., but in 1 (5%) patient, the tension was not controlled

**SURGICALLY CONTROL**



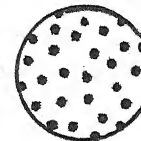
**85%**

**CONTROLLED SURGICALLY  
WITH MEDICAL THERAPY**

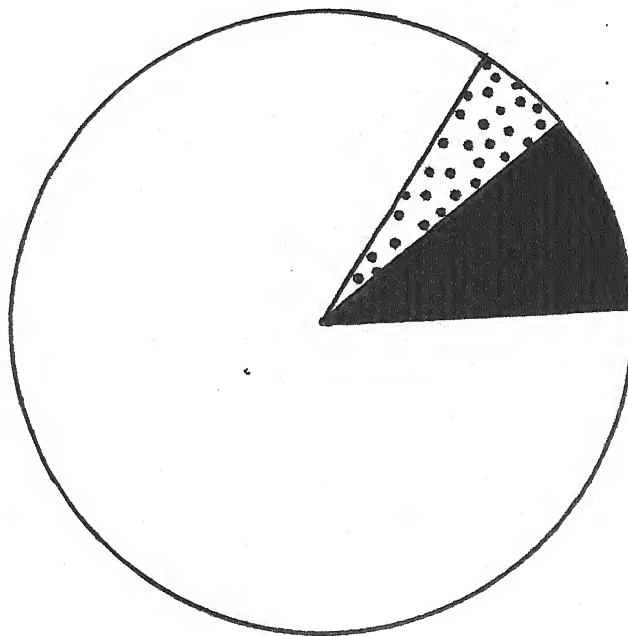


**10%**

**UNCONTROLLED**



**5%**



GRAPH REPRESENTING THE  
TENSION CONTROL AFTER  
COMBINED OPERATION

even after medical therapy. Only 13 patients were present for the follow-up examination during 2 - 4 months period and 12 eyes had controlled tension and only one eye was uncontrolled after medical therapy.

12 out of 20 cases present for the follow up examination during 4 - 6 months period. In all 11 eyes were controlled and one is uncontrolled. Only six patients present for the follow-up period during 6 - 8 months and 5 were controlled and one is uncontrolled. Two cases present for the follow up period for 8 - 10 months and one eye controlled and one same is uncontrolled.

In surgically uncontrolled patient the bleb was absent and in rest operated 19 (95%) case bleb was present.

VISUAL ACUITY :

The table no. 13 shows the pre-operative and post-operative visual acuity. The visual results are tabulated that recorded at the end of the follow-up examination.



Table - 13

## Pre and Post-operative visual acuity

Visual acuity	Pre-operative		Post-operative	
	No.	%	No.	%
No.PL - PR	0	0	0	0
PL - PR	11	55	0	0
HM - CF	8	40	0	0
1/60 - 3/60	1	5	1	5
4/60 - 5/60	0	0	0	0
6/60 - 6/36	0	0	6	30
6/24 - 6/18	0	0	7	35
6/12 - 6/9	0	0	6	30
6/6	0	0	0	0
Total	20	100	20	100

Post-operatively 6 (30%) had 6/9 - 6/12 vision, 4 out of 6 had 6/12 vision, and remaining 2 has 6/9 vision.

7 (35%) eyes had vision 6/18 - 6/24. 5 out of 7 had 6/18 vision and 2 had 6/24 vision after operation and follow-up. 6 (30%) had vision in between 6/36 - 6/60. 5 eyes out of 6 had vision 6/36 and one eye had vision 6/60 only.

One (5%) eye had vision between 1/60 - 3/60 and this was 2/60.

Pre-operatively, the vision acuity of all 20 eyes were less than 6/60.

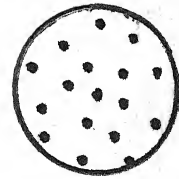
Post-operatively 6 (30%) eyes had visual acuity in between 6/9 - 6/12.

7 (35%) eyes had visual acuity in between 6/18 - 6/24.

6 (30%) eyes had visual acuity in between 6/36 - 6/60.

One (5%) eye was had visual acuity 2/60.

GOOD

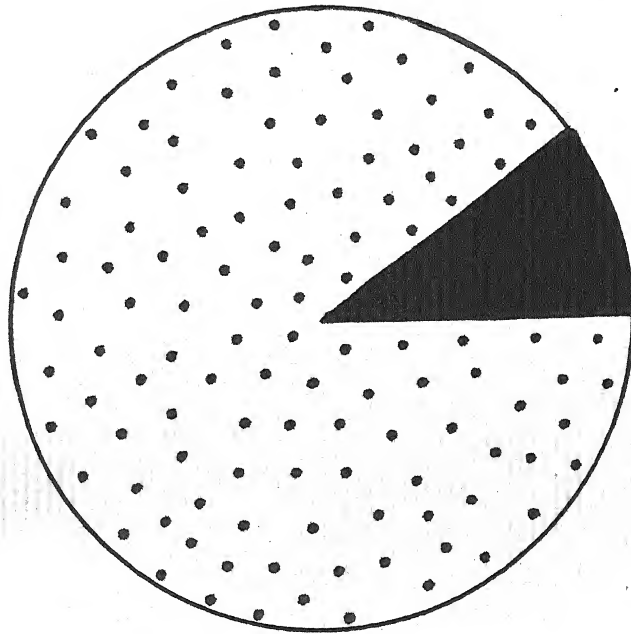


90%

POOR



10%



GRAPH REPRESENTING  
THE VISUAL IMPROVEMENT  
AFTER COMBINED OPERATION



## **DISCUSSION**



## DISCUSSION

---

Cataract and glaucoma often co-exist in elderly and geriatric people, which is also common in this part of country. We combined trabeculectomy and intracapsular lens extraction for patients in whom cataract and chronic simple glaucoma co-exist. A single procedure which accompanies two purposes is much more desirable than two separate operations. It has got obvious advantages. Patient is financially less burdened because of one surgery and one time hospitalisation. The avoidance of prolonged use of medication, early restoration of vision, avoidance of problems of aphakic glaucoma and second operation.

For these various reasons, a number of authors have recommended the combined procedure. They include anterior sclerotomy with lens extraction (Wright, 1937; Lee & Weih, 1950), iridencleisis (Birge, 1952). Sclerotomy with iris inclusion (Hughes, 1959), sclerotomy with cautery (Stocker, 1965). Though on the whole results have been good and operations justified, all were concerned about the complications.

The commonest complications are - (1) syndrome of profuse filtration : flat anterior chamber hypotony and choroidal detachment; (2) haemorrhage; (3) endophthalmitis and, (4) loss of vitreous.

So the choice of which combined operation is to perform. Trabeculectomy has been shown to be a effective and safe operation in co-exist patients of glaucoma with cataract (Shmeleva, 1972; Hilsdorf, 1974). The trabeculectomy has the advantage of guarded filtering wound. So better glaucoma control can be attained and there is possible avoidance of shallow or flat anterior chambers post-operatively. So trabeculectomy and cataract extraction simultaneously were done in the present study for its further evaluation.

This series consisted of 20 patients of chronic simple glaucoma with cataract. All 20 eyes were operated for cataract extraction with trabeculectomy and follow-up was done.

Age and Sex :

The age of the patients varied from 31 to 70 years. The average age of the patients was 56.3 years. The maximum number of patients recorded in the six and seventh decade.

This shows that the co-existing condition of cataract and glaucoma is basically a problem of geriatric people.

As for as sex is concerned 17 (85%) were female, while 3 (15%) is male.

The most common type of cataract associated with glaucoma were mature cataract 15 (75%) and immature cataract 5 (25%).

Maximum patients 12 (60%) belongs to the rural and sub-urban area and on 8 (40%) from urban area, indicates that this disease is more common in villagers. We further observed that 15 (75%) patients belongs to lower and lower middle class.

The pre-operative visual acuity was very low in our study because of advanced lenticular opacities with glaucoma.

In 19 (95%) eyes the vision was counting finger or less than that. Only one(5%) eye had visual acuity 1/60.

As the major disadvantages considered with combined cataract extraction and trabeculectomy is higher risk of complication. So this part will be discussed first.

## OPERATIVE COMPLICATIONS :

### Rupture of lens :

The rupture of lens or unplanned extra-capsular cataract extraction occur in 2 (10%) eyes. Its incidence in cataract extraction alone could be 12% (Towan & Casey, 1955). In other reported series of combined cataract extraction, its incidence are (Hughes et al, 1963) 5%; (Maumenee et al, 1970) 5%; (Gordon et al, 1979) 2.7%; (Singh et al, 1979) 20%; (Edwards, 1980) 8.5% and (Romem et al, 1982) 6%.

So its incidence is not higher than cataract extraction alone.

### Hyphaema :

In this series of cases operated. The blood in the anterior chamber is seen in 2 (10%) eyes. The literature had only a few reports with the blood in the anterior chamber as operative complication. Dhar et al, (1984) reported 7.4% cases had blood in the anterior chamber.

### Iris injury :

In our study it was seen in one (5%) eyes. It was reported in 11.4% eyes by Singh et al (1979). This incidence is not frequently mentioned in the literature.



### Vitreous prolapse :

In our study it was seen in one (5%) case. The incidence have been reported 3% (Duke Elder, 1969). The incidence of vitreous loss had been reported by different authors. Using similar combined procedure, it was 5.4% (Gorden et al, 1979); 5.7% (Singh et al, 1979); 3.4% (Edwards, 1980) and 4.3% (Klemetti and Kalima, 1982).

Thus vitreous loss of 5% is quite comparable with other reported series of combined cataract extraction with trabeculectomy.

### POST-OPERATIVE COMPLICATIONS :

#### Striate Keratitis :

In our study it was seen in 6 (30%) eyes. It was mild striate keratitis, which cleared up in all these eyes by the time of discharge. It does not produce any adverse effect on the visual outcome. Its incidence could have further been reduced by minimising the instrumental handling.

#### Iritis :

Post-operative iritis was observed in 3 (15%) cases. It is the common complication after surgery. It is moderate in nature. It was controlled in all

the cases. Its incidence in other reported series of similar combined extraction is 10.2% (Edward, 1980) and 4.3% (Singh et al, 1979).

Hyphaema :

It was seen in 2 (10%) eyes in our series. It appeared on second day which was about 1/3 of anterior chamber and absorbed in the all eyes at the time of discharge. Its incidence in the same combined procedure as reported by the various workers are 25% (Witmer, 1976); 41% (Jerndal and Lundstrom, 1976); 31% (Stewart and Loftis, 1976); 10.8% (Gordon et al, 1979); 25% (Edwards, 1980) and 35% (Manzoor et al, 1981). As the hyphaema resolved in all the cases, it did not interfere with the visual outcome.

The incidence of hyphaema in combined cataract extraction with trabeculectomy is obvious because of open schlemm's canal and cut vessels of scleral lamellae.

Hypotony :

It was seen in 2 (10%) eyes. In simple trabeculectomy incidence of hypotony was 33.3% (Dutta, 1975) and 21.4% (Mital et al, 1979). In combined cataract extraction and trabeculectomy Klematti & Kalima (1982) recorded hypotony

in 37.2% of cases. Galin et al (1969) reported persistent hypotony in one (2.17%) eye when used cataract extraction with cyclodialysis.

The chances of hypotony are justifiable in combined extraction as it could be because of over filtration itself.

Shallow anterior chamber :

It was seen in one (5%) eye. It was persistent and was associated with a small subconjunctival iris prolapse.

Shah (1971) observed 13.5% cases of shallow anterior chamber in a series of 500 cases of cataract extraction. Its incidence in combined extraction with trabeculectomy were 6.8% (Gordon et al, 1979); 6.8% (Edwards, 1980); 9.6% (Klematti and Kalima, 1982) and 6% (Romem et al, 1982). So the incidence in our series is 5% only and not more than cataract extraction alone.

LATE POST-OPERATIVE COMPLICATION :

Iris prolapse :

It was seen in 1 (5%) case only. It was seen in 1 (1.7%) out of 59 eyes (Edwards, 1980) and in 5.9% (Jerndal & Lundstrom, 1976) in similar combined procedure.

Vitreous opacities :

It was observed in 2 (10%) eyes. It could be degenerative or haemorrhagic in origin. Vitreous haemorrhage has been recorded by Romem et al (1982) in 2 (4.35%) eyes, out of 46 eye using similar combined procedure.

Distortion of pupil :

It was observed in 3 (15%) eyes. It is a minor post-operative complication. It does not have any deleterious effect on the visual outcome.

In our series of study no eye developed infection either of wound or filtering bleb throughout the follow up period. Minimum changes of infection in trabeculectomy is because of the fact that filtering bleb is not much prominent and moreover, the filtering bleb is covered by superficial scleral lamellae.

TENSION CONTROL :

The control of intra-ocular pressure was achieved without medical therapy in 17 (85%) eyes. The success rate for eyes not receiving post surgical treatment in a series of similar combined operation varied from 80 to 95% (Hilsdorf, 1974; Bregeat, 1975; Jerndal & Lundstrom, 1966; Manzoor et al, 1981; Edwards, 1980; and Wechsler &



Robinson, 1980; and Prashad et al, 1988). Our results are favourably comparable with these results. The control of intra-ocular pressure with medical therapy was achieved in 2 (10%) eyes both by the end of two months and in only 1 (5%) eye tension was not controlled even after medical therapy. In this uncontrolled eye filtering bleb was not formed.

The average reduction of pressure post-operatively at the end of 15<sup>th</sup> day was 19.05 mm. of Hg. This lowering was highly significant ( $P \leq 0.001$ ) statistically.

The average reduction of pressure at the end of one month follow-up was 18.52 mm. of Hg. This lowering was again highly significant ( $P \leq 0.001$ ) statistically.

The average reduction of pressure at the end of two months of follow-up was 16.52 mm. of Hg. This lowering was also highly significant ( $P \leq 0.001$ ).

The average reduction of pressure is more at first four weeks of follow-up. As this was because of transient hypotony.

In our series 19 (95%) eyes had filtering bleb out of 20 eyes. Filtering bleb was seen in 45 (74%) out of 61 surgically controlled eyes (Klemetti & Kalima, 1982). 50% (Jerndal & Lundstrom, 1976) and 55% (Manzoor et al, 1981).

Wechsler & Robinson (1980) operated 70 eyes in 4 groups and analysed the results. The success rate in tension was 40.5% in cataract extraction alone.

The success rate was 65.5% when drainage operation was followed by cataract operation and success rate was 79% with combined operation, other than trabeculectomy and success rate was 91%, when combined with trabeculectomy. So the best results were obtained in the last procedure.

#### VISUAL PROGNOSIS :

As the pre-operative visual acuity was less than 1/60 to only PL. Probably because of advanced lenticular opacities. Some improvement of vision was expected in all the cases.

Our criteria for visual improvement was when the visual acuity improved atleast by (3) snellen's line. This visual improvement was recorded in 18 (90%) eyes, but in two (10%) eye vision is improved but not according to our criteria.

In these eyes pre-operative vision was only PL and post-operative vision in one eye was 6/60 and in other eye it was only 2/60.

In first eye fundus examination revealed marked optic atrophy and in second eye, there is optic atrophy alongwith vitreous opacities.

The marked visual improvement in 90% eye is favourably comparable with the result of similar procedure in other studies such as - 50% (Kuroda & Takatsuki, 1978); 74% (Stewart and Loftis, 1976); 82.3% (Jerandal & Lundstrom, 1976); 64.9% (Gordon et al, 1979); 82.9% (Singh et al, 1979); 85% (Manzoor et al, 1981); and 86.36% (Prashad et al, 1988).

Recording of visual field was not possible in our study pre-operatively, because of marked diminution of vision.

The control of intra-ocular pressure and visual improvement in our study are rewarding at the expense of slight increase in the rate of complications and it is needed long term follow-up to establish the final outcome of the combined procedure.



# **CONCLUSION**



## CONCLUSION

---

The present study of combined cataract extraction with trabeculectomy was carried out in the department of Ophthalmology, M.L.B. Medical College & Hospital, Jhansi between March, 1989 to May, 1990. Twenty patients were underwent this combined surgery. The review of observations and results lead to following concluding points :

1. Co-existing condition of chronic simple glaucoma and cataract is essentially a problem of geriatric population.
2. The control of intra-ocular pressure is highly significant ( $P < 0.001$ ).
3. A good tension control is achieved. The tension was controlled surgically in 85% cases, but in other 10% cases medical therapy was also required. The average reduction of intra-ocular pressure post-operatively is 16.52 mm. of Hg. and it is highly significant statistically ( $P < 0.001$ ).
4. A filtering bleb is very essential for the maintenance of filtration. A well guarded filtering bleb is formed which is the base of better tension control.

5. There is early restoration of good vision in 90% of cases.
6. The most common complications during and after surgery were hyphaema, rupture of lens capsule, vitreous prolapse, striate keratitis and iritis.
7. Other complication such as iris prolapse, hypotony and shallow anterior chamber were insignificant. Overall complications of combined procedure when compared with two separate operations were not significant.
8. The combined operation of cataract extraction and trabeculectomy gives results comparable to those obtained for separate procedures.
9. The advantages of combined procedure is to avoid multiple surgeries and to avoid problem of aphakic glaucoma.
10. It is safe, effective and valid alternative of patients of chronic simple glaucoma with cataract.

BIBLIOGRAPHY

---

1. Adolf Weber (1876) : Cited by Duke Elder's system of ophthalmology. London : Henery Kimpton, 1969 : 11 : 505.
2. Antonie Pierre De Mours (1818) : Cited by Duke Elder's system of ophthalmology. London : Henery Kimpton, 1969 : 11 : 383.
3. At - Tabari (10th Century) : Book of Hippocratic treatment : Cited by Duke Elder's system of ophthalmology. London : Henery Kimpton, 1969 : 11 : 381.
4. Becker, B. et. al : Hyperosmotic agent in symposium on ocular therapy. vol. 3 IH leopold ed st Louis, Mosby Co., 1968 : 42.
5. Becker, B. : In round table discussion symposium on glaucoma st. Louis. The C.V. Mosby, 1967 : 2 : 263.
6. Becker, B. and Hey : Ephidrine and acetazomide in the therapy of chronic glaucoma. Am. J. Ophthal., 1958 : 45 : 639.
7. Birge, H.L. : Glaucoma with cataract : Surgically cured by a single operation. Trans. Am. Ophthalmol. Soc., 1952 : 50 : 241.

8. Birge, H.L. : Sclerectocleisis for glaucoma with lens extraction for cataract. Trans. Am. Ophthalmol. Soc., 1966 : 64 : 332.
9. Costroviejo, R. : Comments on cataract surgery usual and unusual procedure including an evaluation of cryotraction. Am. J. Ophthalmol., 1966 : 61 : 1063.
10. Celsus (C. 25 B.C.-A.D.-50) : Quoted by Duke Elder's system of ophthalmology. London; Henery Kimpton, 1969 : 11 : 244.
11. Chandler, P.A. : Am. J. Ophthalmol., 1947 : 30 : 483.
12. Collahan, A. : Cataract extraction after glaucoma surgery. Arch. Ophthalmol., 1952 : 47 : 132.
13. Curan : A new operation for glaucoma involving a new principle in the etiology and treatment of chronic primary glaucoma. Arch. Ophthalmol., 1920 : 47 : 131.
14. Dellaporta, A. : Combined trabeculectomy and cataract extraction. Trans. Am. Ophthalmol. Soc., 1971 : 69 : 113.



15. Donders (1862) : Cited by Duke Elder's system of ophthalmology. London : Henery Kimpton, 1969 : 11 : 387.
16. Edwards, R.S. : Trabeculectomy combined with extraction : A follow-up study. Br. J. Ophthalmol., 1980 : 64 : 720.
17. Galen (C.AD. 131 - 210) : Cited by Duke Elder's system of Ophthalmology. London : Henery Kimpton, 1969 : 11 : 249.
18. Gordon, E.J. & Layden, W.E. : Combined trabeculectomy and cataract extraction. Am. J. Ophthalmol., 1979 : 88 : 973.
19. Guyton, J.S. : Choice of operation for primary glaucoma combined with cataract extraction. Arch. Ophthalmol., 1945 : 33 : 265.
20. Guyton, J.S. : In discussion Birge, H.L. Glaucoma with cataract surgically cured by single operation. Trans. Am. Ophthalmol. Soc., 1952 : 50 : 261.
21. Heinrich Muller (1856) : Cited by Duke Elder's system of ophthalmology. London : Henery Kimpton, 1969 : 11 : 385.

22. Hilsdorf, C. : Trabekulektomie und Linsen  
extraktion line Kombinierte glukom - Ketrakt  
operation ( Germ.) Klin Monatsbl Augeheilkd,  
1974 : 164 : 298.
23. Hughes, W.L. : Report on a combination operation  
for cataract and glaucoma. Am. J. Ophthalmol.,  
1959 : 48 : 1.
24. Ingram, H.V. : Cataract extraction after filtering  
operation for glaucoma. Trans. Ophthalmol. Soc.,  
U.K., 1963 : 83 : 453.
25. Jacques Daviel (1748 - 53) : Cited by Duke Elder's  
system of ophthalmology. London : Henery Kimpton,  
1969 : 11 : 253.
26. Jerndal, T. & Lundstrom, M. : Trabeculectomy  
combined with cataract extraction. Am. J. Ophthalmol.,  
1976 : 81 : 227.
27. Khurana, A.K. & Ahluwalia, B.K. : Trabeculectomy  
Vs Goniotomy - combined with cataract extraction.  
Ind. J. Ophthalmol., 1988 : 36 : 71.
28. Klemetti, A. & Kalima, T. : Combined trabeculectomy  
and cataract extraction. A follow-up study. Acta.  
Ophthalmol., 1982 : 60 : 259.

29. Lee, O.S. and Weih, J.E. : Results of operation for cataract and primary glaucoma. Arch. Ophthalmology, 1950 : 44 : 275.
30. Leydhecker : Cited by Duke Elder's system of Ophthalmology. London : Henery Kimpton, 1969 : 11 : 555.
31. Mackenson, G. and Orsoni, G.J. : Cataract extraction combined with trabeculectomy. Klin Monatsbl Augenheilkd, 1978 : 178 : 756.
32. Manzoor, A.; Gauhar, A. and Ghulam, R.D. : Simultaneous trabeculectomy and cataract extraction. Ind. J. Ophthalmol., 1981 : 29 : 153.
33. Mawas, E. : In discussion in Boberg. Ans. J. Simultaneous operation for cataract and glaucoma report on 30 cases. Trans. Ophthalmol. Soc. U.K., 1964 : 84 : 113.
34. Mehra & Dutta, J. : All India Ophthalmol. Soc., 1963 : 11 : 1.
35. O'Donoghue, H.N. : A combined cataract glaucoma operation. Trans. Ophthalmol. Soc. U.K., 1972 : 92 : 259.

36. Philips, C.I., Howit, G. and Rowland, D.J. :  
Propranolol as ocular hypotensive agent.  
Br. J. Ophthalmol., 1976 : 15 : 489.
37. Prashad, V.N.; Mool Narain and Grover Sandeep :  
Combined trabeculectomy and cataract extraction.  
Ind. J. Ophthalmol., 1988 : 36 : 156.
38. Randolph, M.E.; Maumenee, A.E. and Illiff, C.E.:  
Cataract extraction in glaucomatous eyes.  
Am. J. Ophthalmol., 1971 : 71 : 328.
39. Richard Banister (1622) : Cited by Duke Elder's  
system of ophthalmology. London : Henery,  
Kimpton, 1969 : 11 : 381.
40. Rufos (C.A.D. 95 - 117) : Cited by Duke Elder's  
system of ophthalmology. London : Henery, Kimpton,  
1969 : 11 : 380.
41. Scheie, H.G. : Cataract extraction after filtering  
procedure. Arch Ophthalmol., 1962 : 68 : 34.
42. Scudari, G. : Surgical therapy of associated  
glaucoma and cataract : An Inst. Barraquer,  
1967 : 6 : 64.
43. Shmeleva, V.V. : Single stage cataract extraction  
and trabeculectomy. Vestn. Oftal., 1972 : 6 : 44.



44. Singh, D.; Verma, A. and Singh, M. : Combined cataract extraction with pre-trabecular filtration. *Ind. J. Ophthalmol.*, 1979 : 27 : 66.
45. Sourdille, G.P. : Glaucoma et cataracte. *Bull. Mem. Soc. Fran. Ophthal.*, 1950 : 63 : 242.
46. Spaeth, G.L. : The management of patients with conjoint cataract and glaucoma. *Ophthal. Surgery*, 1980 : 11 : 780.
47. Stepanik : *Klin Mbl Augeheilked*, 1961 : 139 : 174 and 1965 : 146 : 176.
48. Stewart, R.M. & Loftis, M.D. : Combined cataract extraction and thermal sclerotomy versus combined cataract extraction and trabeculectomy. *Ophthal. Surgery*, 1976 : 7 : 93.
49. Stocker, F.W. : Combined cataract extraction and scleral cauterization. *Arch. Ophthalmol.*, 1964 : 72 : 503.
50. Sugar, H.S. : Post-operative cataract in successfully filtering glaucomatous eyes. *Am. J. Ophthalmol.*, 1970 : 69 : 740.
51. Sugar, H.S. : Some recent advances in glaucoma surgery. *Am. J. Ophthalmol.*, 1962 : 54 : 917.

52. Thomas Bull. Soc. Ophthal. Paris, 1947 : 497.
53. Vancea, P.P. & Schwarts enberg, T. : Cataract extraction with trabeculectomy. Clin. Ophthalmol. Jessy Ann. Oculist., 1974 : 207 : 337.
54. Wachsler, A. and Robinson, L.P. : Simultaneous surgical management of cataract and glaucoma. Aust. J. Ophthalmol., 1980 : 80 : 151.
55. Williamson : Nobel cataract extraction after glaucoma operation. Trans. Ophthalmol. Soc. U.K., 1953 : 73 : 585.
56. Williamson Mackenzie (1830) : Cited by Duke Elder's system of ophthalmology. London : Henery Kimpton, 1969 : 11 : 528.
57. Witmer, R. and Rohen, J.W. : Combined cataract glaucoma operation. Trans. Ophthalmol. Soc. U.K., 1976 : 96 : 256.
58. Wolfe, O.D. : Glaucoma and cataract. Tr. Iowa Med. Soc., 1952 : 42 : 522.
59. Wright, R.E. : Lecture on cataract : Posterior segment complications in the post-operative period. Some difficult extractions. Am. J. Ophthalmol., 1937 : 20 : 376.

APPENDIX - I

DEPARTMENT OF OPHTHALMOLOGY,  
M.L.B. MEDICAL COLLEGE & HOSPITAL, JHANSI.

PROFORMA FOR EXAMINATION

Case No. : Date :

1. Name of Investigator :
2. Surgeon I/c :
3. Place :

Details of Patient :

1. Name :
2. Age / Sex :
3. Ward / Bed :
4. Occupation :
5. Address :
6. Socio-economic status :
7. Habit of taking any  
intoxication :

---

A. Presenting Symptoms :

- 1.
- 2.
- 3.
- 4.
- 5.

B. Brief history of present illness :

- Past History :
  - H/o Hypertension
  - Diabetes
  - Tuberculosis
  - Any other
- Family History :

EXAMINATIONGeneral Examination :

- C.V.S.
- C.N.S.
- Respiratory
- Abdomen
- Lymphnode

Local Examination :Rt. eyeLt. eye

1. Facial symmetry
2. Eye Brows
3. Eye Lashes
4. Eye lids
5. Conjunctiva
  - Bulbar
  - Limbal
  - Palpiteral
6. Cornea
  - Size
  - Shape
  - Surface
  - Curvature
  - Lusture
  - Transparency
  - Sensitivity
7. Anterior chamber
  - Depth - Normal  
Shallow/deep
  - Content - Flare, if any
8. Iris :
  - Colour
  - Surface
  - Pattern
  - Atrophy (if any)



- |                           | <u>Rt. eye</u> | <u>Lt. eye</u> |
|---------------------------|----------------|----------------|
| 9. Pupil :                |                |                |
| - Size                    |                |                |
| - Shape                   |                |                |
| - Colour                  |                |                |
| - Reaction to light -     |                |                |
| . Direct                  |                |                |
| . Consensual              |                |                |
| 10. Lens :                |                |                |
| - Position                |                |                |
| - Transparency            |                |                |
| - Colour                  |                |                |
| - Any other finding       |                |                |
| 11. Visual acuity :       | Rt.            | Lt.            |
| 12. Tension - Digital     |                |                |
| - Byshiotz Tonometer      |                |                |
| 13. Fundoscopy            |                |                |
| 14. Gonioscopy            |                |                |
| 15. Perimetry             |                |                |
| 16. Slit Lamp Examination |                |                |
| 17. Diagnosis :           |                |                |

#### INVESTIGATION

- Urine examination
- Blood routine
- Blood sugar

#### COMPLICATION DURING OPERATION

Rupture	Vitreous prolapse/loss	Hyphaema	Iris injury	Any other

FOLLOW-UP CHART

Patient's name :

Diagnosis :

Eye : Rt. / Lt. :

Case No. :

Date of Examination :

Rt.Lt.

Ocular tension :

Fundus Disc cupping :

Corrected visual  
acuity :

Perimetry :

Gonioscopy :

Bleb size &amp; thickness :

Post-operative complication :

- Hyphaema
- Infection
- Iritis
- Striate
- Keratitis
- Others